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THYMOL ADMINISTRATION.

SUBJECTIVE EFFECTS IN 464 ADMINISTRATIONS IN 243 PATIENTS.

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It has recently been possible for us to follow 243 patients during a total of 464 thymol administrations, and to obtain from them statements as to their subjective symptoms. These patients were treated from 1 to 7 times each, according to circumstances. A "treatment" consisted of one or two preliminary doses of Epsom salts (5 and 8 p. m., or in the evening of two succeeding days), thymol the next morning (divided into two doses, at 6 and 8, or in three doses, at 6, 7, and 8), followed by salts at 10.

Cases Nos. 1 to 207, inclusive, were treated at the United States Marine Hospital, Wilmington, N. C.; cases 322 to 537, inclusive, were treated in County Z, on board an Atlantic Coast Line Railroad special car that was fitted up temporarily as a traveling hospital.

Summarized, the results are as follows, the symptoms being arranged in order of their frequency:

Symptoms, etc.	Treatments.	
	Number.	Per cent of total.
Total number of patients, 243.		
Total treatments.....	464	100.0
Ill effect absent.....	259	55.8
Ill effect present (as follows).	205	44.1
Sickness at the stomach (nausea).....	66	14.2
Weakness.....	62	13.3
Burning in the stomach.....	45	9.7
Dizziness (including also "giddiness," "drunk," "staggery").....	44	9.4
Headache.....	14	3.0
Vomiting.....	13	2.8
Burning in the throat.....	8	1.7
Pain in the stomach ¹	7	1.5
Drowsiness or sleepiness.....	5	1.1
Sick after discharge from treatment.....	3	.64
Chill (apparently not due to treatment).....	1	.21
Dyspnea.....	1	.21
Irregular heart following thymol.....	1	.21
Fainted.....	1	.21
Deaths.....	0	0.

¹ The term "stomach" as commonly used by patients does not necessarily correspond exactly with the anatomical term.

It will be noticed that in 259 treatments (55.8 per cent) the patients made no complaint of any unpleasant effect from the treatment, while in 205 cases (44.1 per cent) the patients did complain.

The most common complaint was of a "sickness at the stomach" (nausea), which was present in 66 treatments (14.2 per cent). In some instances this condition was clearly due to the thymol, but in other instances it seemed to be due to the magnesium sulphate.

The second most frequent complaint was of "weakness," which was noticed in 62 cases (13.3 per cent). This may well have been due to thymol or to salts in some instances, but it seems to have been due in other cases, at least, to the fact that the patients were allowed no breakfast. Usually this weakness was relieved upon eating dinner. By introducing a slight change in the routine we seem to have reduced the complaints. Instead of keeping the patients entirely without food, we allowed them coffee (without milk) at 9.30 a. m. and coffee (without milk) with crackers (no butter) at 10.30. This procedure did not entirely do away with the complaint regarding weakness, but it certainly made the children much more contented.

The third complaint in order of frequency was of a "burning in the stomach" following thymol; this occurred in 45 treatments (9.7 per cent).

Fourth in frequency was a complaint of "dizziness" (including "giddiness," "staggery," "drunk"), this occurring in 44 treatments (9.4 per cent). This was clearly due to thymol in some cases and perhaps to thymol in all cases.

Headache (14 cases = 3 per cent) and vomiting (13 cases = 2.8 per cent) were almost equally frequent. Just how much of these two symptoms were due to the thymol and how much to the salts and to the other factors is not quite clear.

"Pain in the stomach" or "stomach ache" (7 treatments = 1.5 per cent) was an indefinite complaint referable to the entire abdomen and probably due to the salts.

The "drowsiness" or "sleepiness" (5 cases = 1.1 per cent) may have been due to loss of sleep in at least some of the cases.

The chill (1 case = 0.2 per cent) was probably not connected with the treatment in any way.

Dyspnea and irregularity of the heart (1 case = 0.2 per cent) developed in the same patient, who seemed to have an idiosyncrasy to thymol.

The one (0.2 per cent) case of fainting was in a girl who was particularly susceptible to magnesium sulphate.

In three cases the patients were taken ill after discharge the afternoon of the day of thymol treatment. In one of these cases the illness was due to an attack of malaria. In a second case it followed

an indiscretion of diet. The third case is not clearly explained; possibly it was an after effect of the treatment, possibly it was not connected with the thymol.

Irregularity of symptoms.—Some patients show no ill effect upon the first treatment, but develop symptoms on later treatments. Others show ill effects on first treatment, but none on subsequent treatment. Accordingly, while the behavior of a patient during his first course with thymol may indicate an idiosyncrasy to the drug (as No. 386), it is no necessary criterion of what may occur during subsequent treatments.

Quiet.—In general, it may be stated that patients feel better when they remain in bed as much as possible until dinner time, but some patients take thymol, do not remain in bed, and yet suffer no ill effect.

It is our custom not to discharge patients until all of their subjective symptoms have disappeared. In only two cases has it been deemed necessary to keep the patients overnight, after thymol.

Effects of these symptoms on the lay mind.—Because of various reports regarding the effects of thymol, not a few persons have considerable fear of the drug, and reports of sickness or of death during treatment have undoubtedly been a very important factor in inhibiting some persons from taking the first course of treatment and in inhibiting others from continuing the treatment. Thus the symptoms in question are a factor to be considered in connection with the eradication of hookworm disease.

That a few deaths have occurred during thymol treatment can not be denied. Some of these fatalities were due to following the thymol with castor oil; some were due to a failure to carry out directions; in some instances the details have not as yet been established. Just how important a factor Epsom salts may have been, as in cases of kidney trouble or overdose, for instance, is not determined.

As for the cases of relatively severe illness that have followed hookworm treatment, cases that have made quite an impression on the lay mind, many of these have been due to pure carelessness on the part of the patient or his family, some have undoubtedly been due to the Epsom salts, others doubtless to the thymol.

But whatever the details may be in regard to the cause of the sickness or deaths that have occurred, the fact remains that they have occurred and that in a small percentage of instances they will occur in the future.

The more we come in contact with patients and see how the light cases especially, and even many severe cases, avoid treatment, the more thoroughly convinced we are that unless the present medical work is followed by redoubled efforts to improve the sanitation, a considerable portion of our efforts thus far will have resulted in only

temporary benefit. We would not be interpreted as saying one word against the medical side of this campaign—the work is good, the results are excellent and as good as can be expected—but no effort should be spared to warn the public that thymol and salts alone, without the addition of a sanitary privy, will not eradicate hookworm disease.

Our interpretation of the present status is that the laity to-day has far too much faith in drugs and far too little knowledge of privies.

DETAILS OF CASES.

The details of the 461 treatments taken as basis for the present paper are as follows:

1. The following 97 patients, representing a total of 161 treatments, did not complain of any ill effects:

(a) Treated once:	(a) Treated once—Continued.
No. ¹ 88 ¹ -m ¹ -5. ?y ¹ -7. 5 g. ¹	No. 526-m-14. ?y-15 g.
No. 93-m-7. ?y-15 g.	No. 527-m-14. ?y-25 g.
No. 97-m-7. ?y-15 g.	No. 503-m-14. ?y-25 g.
No. 172-m-7. ?y-15 g.	No. 191-m-14. ?y-25 g.
No. 508-m-7. ?y-5 g.	No. 519-f-14. 5y-20 g.
No. 511-f-8. 2y-7.5 g.	No. 56-m-15. ?y-20 g.
No. 158-m-9. ?y-15 g.	No. 6-m-15. ?y-30 g.
No. 153-m-9. ?y-20 g.	No. 518-f-15. 8y-20 g.
No. 509-m-9. ?y-7.5 g.	No. 5-m-16. ?y-30 g.
No. 512-f-9. 3y-10 g.	No. 7-m-16. ?y-30 g. ²
No. 51-m-10. ?y-5 g.	No. 57-m-16. ?y-30 g.
No. 510-m-10. ?y-7.5 g.	No. 30-m-17. ?y-48 g.
No. 379-f-10. 5y-10 g.	No. 517-m-17. ?y-30 g.
No. 383-f-10. 9y-12.5 g.	No. 68-m-18. ?y-40 g.
No. 170-m-11. ?y-25 g.	No. 182-m-17. ?y-45 g.
No. 516-f-11. ?y-12.5 g.	No. 31-m-19. ?y-45 g.
No. 344-m-11. 7y-10 g.	No. 16-m-19. ?y-60 g.
No. 398-m-11. 8y-12.5 g.	No. 21-m-20. ?y-45 g.
No. 178-m-11. ?y-15 g.	No. 52-m-20. ?y-45 g.
No. 109-m-12. ?y-25 g.	No. 10-m-20. ?y-60 g.
No. 157-m-12. ?y-25 g.	No. 204-m-22. ?y-40 g.
No. 500-m-12. ?y-12.5 g.	No. 207-m-23. ?y-50 g.
No. 501-m-12. ?y-15 g.	No. 70-m-24. ?y-60 g.
No. 192-m-12. ?y-30 g.	No. 514-f-27. ?y-40 g.
No. 163-m-13. ?y-20 g.	(b) Treated twice:
No. 499-m-13. ?y-12.5 g.	No. 521-f-4. ?y-4 g.-5 g.
No. 502-m-13. ?y-20 g.	No. 522-m-6. ?y-5 g.-7.5 g.
No. 119-m-14. ?y-20 g.	No. 165-m-8. 0y-10 g.-15 g.
No. 9-m-14. ?y-24 g.	No. 342-m-9. 9y-10 g.-12.5 g.
No. 55-m-14. ?y-25 g.	No. 474-m-10. 1y-7.5 g.-15 g.
No. 13-m-14. ?y-30 g.	No. 413-f-10. 9y-10 g.-12.5 g.
No. 513-m-14. ?y-20 g.	No. 8-m-10. ?y-15 g.-11. ?y-25 g.

¹ Abbreviations: No.=case number; m=male; f=female; y=years (in tenths of years when possible); g=grains; min.=minutes; ?=decimal of year not recorded.

² Patient had a chill at 1 p. m., also one two days before, hence apparently not due to treatment.

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(b) Treated twice—Continued.

- No. 175-m-11. ?y-11 g.-17.5 g.
 No. 355-m-11. 0y-12.5 g.-15 g.
 No. 79-m-11. ?y-20 g.-20 g.
 No. 494-m-11. 6y-10 g.-15 g.
 No. 362-m-12. ?y-15 g.-10 g.
 No. 524-m-12. ?y-7.5 g.-10 g.
 No. 483-m-12. 0y-15 g.-15 g.
 No. 489-m-12. 5y-20 g.-22.5 g.
 No. 351-m-12. 6y-12.5 g.-20 g.
 No. 395-f-13. 7y-12.5 g.-15 g.
 No. 523-f-15. ?y-15 g.-20 g.
 No. 201-m-16. ?y-30 g.-30 g.
 No. 492-m-17. 2y-25 g.¹-25 g.
 No. 465-m-18. 8y-25 g.-30 g.
 No. 35-m-20. ?y-40 g.-20 g.
 No. 507-f-21. ?y-30 g.-40 g.
 No. 15-m-27. ?y-60 g.-60 g.

(c) Treated three times:

- No. 111-m-10. ?y-20 g.-20 g.-20 g.
 No. 400-m-10 0y-10 g.-15 g.-15 g.
 No. 450-m-10. 1y-7.5 g.-10 g.-12.5 g.
 No. 340-m-10. 5y-12.5 g.-15 g.-15 g.

(c) Treated three times—Continued.

- No. 338-M-11. 1y-10 g.-15 g.-17.5 g.
 No. 458-f-12. 3y-10 g.-10 g.-12.5 g.
 No. 441-m-13. 9y-15 g.-15 g.-20 g.
 No. 438-m-14. 5y-10 g.-15 g.-25 g.
 No. 466-m-14. 6y-10 g.-12.5 g.-17.5 g.

(d) Treated four times:

- No. 331-m-9. 5y-10 g.-12.5 g.-15 g.-15 g.
 No. 416-f-10. 1y-12.5 g.-15 g.-15 g.
 No. 426-f-11. 4y-7.5 g.-12.5 g.-17.5 g.-17.5 g.
 No. 336-m-12. 0y-10 g.-15 g.-20 g.-20 g.
 No. 443-m-12. 6y-7.5 g.-12.5 g.-12.5 g.-17.5 g.
 No. 504-m-13. 9y-10 g.-15 g.-20 g.-20 g.

2. The following 5 cases, representing a total of 12 treatments, complained of a burning in the throat, but of no other ill effect:

(a) Treated once:

- No. 183-m-20. ?y-20 g. Slight burning for few min. after last thymol.
 No. 143-m-26. ?y-50 g. Burning for about 15 min. after each thymol.

(b) Treated three times:

- No. 464-m-11. 2y-7.5 g. No ill effect.
 10 g. Slight burning after first thymol.
 15 g. No ill effect.
 No. 476-f-13. 1y-10 g. After 1st thymol.
 15 g. No ill effect.
 20 g. No ill effect.

(c) Treated four times:

- No. 345-f-11. 7y-10 g. Slight, for 15 min. after 2d thymol.
 12.5 g. No ill effect.
 15 g. No ill effect.
 15 g. No ill effect.

3. The following 12 cases, representing a total of 18 treatments, complained of a burning in the stomach, but of no other ill effect:

(a) Treated once:

- No. 145-m-11. ?y-25 g. Slight for about 10 minutes after taking thymol in hominy; could not swallow capsules.
 No. 169-m-11. ?y-25 g. For about 10 minutes after each thymol.
 No. 25-m-18. ?y-45 g. Slight for a few minutes after first thymol.
 No. 29-m-21. ?y-60 g. Slight for a few minutes after first thymol.
 No. 65-m-25. ?y-60 g. Slight for a few minutes after each thymol.

¹ This boy is said to have been very weak and sick after a treatment in 1911.

(a) Treated once—Continued.

No. 22-m-29. ?y-50 g. Severe; began about 30 minutes after second thymol, lasted about 60 minutes; first complained of stomach, then "lower down."

No. 32-m-38. ?y-60 g. For about 60 minutes after each thymol.

No. 126-m-48. ?y-50 g. Slight for about 5 minutes after each thymol.

(b) Treated twice:

No. 74-m-10. ?y-20 g. For about 2 or 3 minutes after each thymol.
11. ?y-25 g. No ill effect.

No. 110-m-15. ?y-25 g. Slight for about 10 minutes after each thymol.
25 g. No ill effect.

(c) Treated three times:

No. 75-m-5. ?y-10 g. For few minutes after thymol.

10 g. Same dose; no ill effect.

6. ?y-10 g. Same dose; no ill effect.

No. 188-m-22. ?y-60 g. No ill effect.

60 g. Burning in stomach.

60 g. No ill effect.

4. The following 19 cases, representing a total of 27 treatments, complained only of being "sick at the stomach" (nausea).

(a) Treated once:

No. 515-f-7. ?y-7.5 g. Slightly sick at 11 a. m.; relieved by stool.

No. 18-m-7. ?y-8 g. Sick for a few minutes after thymol; at 11.30 again sick for a few minutes, ate dinner at noon and felt well.

No. 202-m-10. ?y-20 g. Sick after each thymol.

No. 17-m-11. ?y-24 g. Lasted only few minutes at a time during forenoon.

No. 505-m-12. ?y-15 g. Sick for about 30 minutes.

No. 50-m-12. ?y-20 g. Slightly sick for few minutes after thymol.

No. 46-m-13. ?y-20 g. Slightly sick for a few minutes after each thymol.

No. 136-m-13. ?y-30 g. Slightly sick for a few minutes after each thymol.

No. 118-m-16. ?y-30 g. Sick for about 10 minutes after thymol.

No. 99-m-17. ?y-30 g. Sick for about 1 hour after thymol.

No. 71-m-25. ?y-60 g. Sick for half an hour after each thymol.

No. 42-m-25. ?y-45 g. Slightly sick after thymol.

No. 116-m-30. ?y-50 g. Slightly sick for few minutes after thymol.

No. 64-m-55. ?y-60 g. Slightly sick for few minutes after thymol.

(b) Treated twice:

No. 473-f-10. 0y-5 g. Sick for few minutes after last thymol.

5 g. No ill effect.

No. 506-f-14. ?y-10 g. Sick at stomach after first dose of 10 g. thymol. Later doses omitted.

20 g. No ill effect.

(c) Treated three times:

No. 103-m-6. ?y-7.5 g. Slightly sick for few minutes after each thymol.

10 g. No ill effect.

10 g. No ill effect.

No. 66-m-13. ?y-20 g. No ill effect.

20 g. Sick at 11 a. m.; given 2d dose of salts, sickness soon passed away.

25 g. Sick for about half an hour after each dose of thymol.

No. 12-m-14. ?y-24 g. Sick at 11 a. m., ate dinner at noon, sickness disappeared.

25 g. No ill effect.

25 g. Sick for about 15 minutes after each thymol.

5. The following 2 cases, representing a total of 2 treatments, complained of stomach ache, but of no other ill effect:

(a) Treated once:

No. 33-m-7. ?y-12 g. "Hurting" in stomach for about 5 minutes after last thymol.

No. 485-f-11. 4y-15 g. Stomach ache 15 minutes after 10 o'clock salts.

6. The following 3 cases, representing a total of 5 treatments, vomited the day of treatment, but they complained of no other ill effect:

(a) Treated once:

No. 520-m-7. ?y-5 g. Vomited part of thymol.

No. 62-m-11. ?y-15 g. Vomited after midday dinner.

(b) Treated three times:

No. 475-m-10. 2y-12.5 g. Vomited part of thymol.

12.5 g. No ill effect.

15 g. No ill effect.

7. The following 12 cases, representing a total of 19 treatments, complained of feeling "dizzy," or "giddy," or "drunk," but of no other ill effect:

(a) Treated once:

No. 89-m-9. ?y-20 g. "Drunk" until noon.

No. 141-m-9. ?y-20 g. Slightly "dizzy" until 11 a. m.; was up playing most of the time.

No. 90-m-12. ?y-30 g. "Giddy" for about 30 minutes after thymol.

No. 498-f-14. ?y-25 g. "Slightly drunk" for short time at 7.30 a. m.; better after coffee.

No. 154-m-15. ?y-30 g. Slightly "dizzy" for about 15 minutes after each thymol.

No. 117-m-18. ?y-40 g. Slightly "dizzy" for a few minutes after thymol.

No. 184-m-19. ?y-45 g. Slightly "dizzy" after 7 a. m. thymol.

No. 26-m-21. ?y-60 g. Rather "drunk" for about 10 minutes after last thymol.

(b) Treated twice:

No. 83-m-18. ?y-50 g. "Giddy" for about an hour; for 1 or 2 minutes everything "became dark," then patient became all right.

50 g. Same dose; no effect.

(c) Treated three times:

No. 405-m-10. 4y-12.5 g. Slightly dizzy; better after coffee.

12.5 g. Dizzy about noon for 10 minutes, then better.

15 g. No ill effect.

No. 27-m-13. ?y-20 g. Slightly "drunk" after 10 o'clock salts for about 5 minutes.

20 g. Same dose; no ill effect.

20 g. Same dose; no ill effect.

No. 94-m-15. ?y-35 g. Slightly dizzy for an hour or more.

40 g. Increased dose; no ill effect.

16. ?y-45 g. No ill effect.

8. The following 32 cases, representing a total of 77 treatments, complained of feeling "weak," but of no other ill effect:

(a) Treated once:

- No. 369-m-9. 2y- 7.5 g. Slightly weak.
- No. 478-f-10. 1y- 7.5 g. Very weak, better after coffee and dinner. Was all right at 2 p. m., but weak again at 2.15.
- No. 488-f-10. 8y-15 g.
- No. 487-f-10. 8y-15 g.
- No. 385-f-11. 3y-17.5 g.
- No. 387-f-11. 7y-15 g. Weak and hungry.
- No. 453-f-11. 9y-12.5 g.
- No. 394-f-11. 9y-15 g. Weak and hungry.
- No. 486-f-12. 4y-20 g.
- No. 193-m-13. ?y-30 g. Weak after morning salts.
- No. 3-m-21. ?y-45 g. Slight weakness until after dinner.
- No. 2-m-24. ?y-45 g. Weak until after dinner.

(b) Treated twice:

- No. 373-f-11. 9y-10 g. Weak after capsules; hungry.
10 g. Same dose; no complaint.
- No. 448-m-10. 2y-10 g. Weak.
12.5 g. Higher dose; no complaint.
- No. 361-m-11. 0y-15 g. Slightly weak.
10 g. No complaint.
- No. 442-f-11. 9y-12.5 g. Slightly weak.
15 g. No complaint.

(c) Treated three times:

- No. 445-m-9. 9y-12.5 g. Weak.
12.5 g. Same dose; weak.
12.5 g. Same dose; weak.
- No. 454-f-10. 4y-12.5 g. No ill effect.
15 g. Weak.
15 g. No ill effect.
- No. 44-m-12. ?y-20 g. Slightly weak.
10 g. No ill effect.
20 g. No ill effect.
- No. 459-m-12. 1y-7.5 g. Weak.
12.5 g. Higher dose; no ill effect.
12.5 g. Higher dose; no ill effect.
- No. 462-m-12. 4y-15 g. No ill effect.
20 g. Weak.
22.5 g. Higher dose; no ill effect.
- No. 490-m-12. 6y-20 g. No ill effect.
22.5 g. Weak.
22.5 g. No ill effect.
- No. 439-m-13. 5y-15 g. No ill effect.
20 g. Weak.
25g. Higher dose; no ill effect.

(d) Treated four times:

- No. 423-f- 9. 8y-12.5 g. No ill effect.
15 g. Weak.
15 g. No ill effect.
15 g. No ill effect.

(d) Treated four times—Continued.

- No. 479-f-10. 0y-7.5 g. Weak.
 12.5 g. Higher dose; no ill effect.
 12.5 g. Higher dose; no ill effect.
 15 g. Higher dose; no ill effect.
 No. 415-f-10. 2y-7.5 g. Slightly weak and hungry.
 12.5 g. Weak.
 15 g. No ill effect.
 15 g. No ill effect.
 No. 442-m-11. 0y-12.5 g. No ill effect.
 15 g. Weak.
 12.5 g. No ill effect.
 15 g. No ill effect.
 No. 396-m-11. 5y-10 g. No ill effect.
 12.5 g. Slightly weak.
 17.5 g. Higher dose; no ill effect.
 17.5 g. Higher dose; no ill effect.
 No. 391-f-11. 9y-15 g. Weak.
 17.5 g. Higher dose; no ill effect.
 17.5 g. Higher dose; no ill effect.
 20 g. Higher dose; no ill effect.
 No. 179-m-12. ?y-15 g. No ill effect.
 25 g. Slightly weak after 10 a. m. salts.
 30 g. No ill effect.
 30 g. No ill effect.
 No. 468-f-12. 5y-10 g. Weak and hungry.
 15 g. Higher dose; no ill effect.
 15 g. Higher dose; no ill effect.
 17.5 g. Higher dose; no ill effect.
 No. 460-m-14. 0y-20 g. No ill effect.
 25 g. Weak.
 20 g. No ill effect.
 25 g. No ill effect.

9. The following 2 cases, representing a total of 2 treatments, complained of headache, but of no other ill effect:

(a) Treated once:

- No. 96-m-10. ?y-15 g. Headache for about 10 minutes after each thymol.
 No. 137-m-25. ?y-50 g. Slight headache during morning, more severe at 11.30 a. m.

10. The following case, representing a total of 4 treatments, complained of burning in the throat and stomach, of being sick at the stomach, and of headache:

(a) Treated four times:

- No. 200-m-19. ?y-45 g. Headache and burning in stomach after thymol, better after coffee; ate too much dinner (rice and corn) and was nauseated, relieved by warm water (vomited).
 45 g. Burning in stomach.
 45 g. Slight burning in throat for a few minutes after 1st thymol.
 45 g. No ill effect.

11. The following case, representing a total of 4 treatments, complained of burning in the throat and of being sick at the stomach:

(a) Treated four times:

- No. 477-f-11. 7y-15 g. Burning in throat after 1st thymol.
- 17.5 g. Sick at stomach until salts.
- 17.5 g. No ill effect.
- 10 g. Sick at stomach after 1st thymol, lasted until salts; 2d and 3d thymols omitted.

12. The following case, representing a total of 2 treatments, complained of burning in the throat and of being weak:

(a) Treated twice:

- No. 388-f-11. 8y-20 g. Weak and hungry.
- 20 g. Burning in throat.

13. The following 2 cases, representing a total of 8 treatments, complained of burning in the stomach and of sickness at the stomach:

(a) Treated three times:

- No. 39-m-15. ?y-20 g. Rather sick at stomach for short time after each thymol.
- 25 g. No ill effect.
- 30 g. Burning for about 10 minutes after each thymol.

(b) Treated five times:

- No. 23-m-10. ?y-12 g. "Felt like wad in neck" after thymol, also burning in stomach for few minutes about 11.
- 15 g. Slightly sick at stomach during morning, as salts did not move. Enema at 12 m., with good return.
- 12.5 g. Slightly sick at stomach before noon; lasted half hour.
- 15 g. Burning in stomach until about noon.
- 20 g. Sick at stomach for few minutes after each thymol.

14. The following case, representing a total of 7 treatments, complained of burning in the stomach, pain in the stomach, headache, and weakness:

(a) Treated seven times:

- No. 45-m-11. ?y-15 g. Pain in stomach for 5 to 10 minutes after each thymol.
- 15 g. Same dose; no ill effect.
- 15 g. Same dose; no ill effect.
- 20 g. Burning in stomach for about 10 minutes after each thymol.
- 20 g. Pain in stomach for an hour after last thymol.
- 12. ?y-25 g. Weak after thymol.
- 20 g. Slight headache for about an hour after thymol.

15. The following case, representing a total of 2 treatments, complained of burning in the stomach, sickness at the stomach, of vomiting, of being drowsy or sleepy, and of headache:

(a) Treated twice:

- No. 20-m-17. ?y-45 g. Was very stupid when admitted, complained of being drowsy and sleepy; just before noon, sick at stomach; ate dinner, then vomited, then felt better except for headache, possibly due to malaria.
- 50 g. Burning in stomach for about 5 minutes after each thymol.

16. The following 2 cases, representing a total of 8 treatments, complained of a burning in the stomach, a sickness at the stomach, and of dizziness or drunkenness:

(a) Treated twice:

No. 11-m-13. ?y-24 g. At 11, sick stomach; recovered after noon dinner.

25 g. Slight burning in stomach and drunk feeling in head for about 10 minutes after each thymol.

(b) Treated six times:

No. 1-m-11. ?y-15 g. At 1 o'clock somewhat sick at stomach; at 2 o'clock all right.

20 g. Increased dose; no ill effect.

12.5 g. Decreased dose; slight burning after thymol; sick at stomach after salts.

22.5 g. Increased dose; no ill effect.

25 g. Increased dose; no ill effect.

30 g. Slightly dizzy and nauseated for about 15 minutes after each thymol.

17. The following case, representing a total of 7 treatments, complained of burning in the stomach, sickness at the stomach, a feeling of being "drunk," and a feeling of weakness:

(a) Treated seven times:

No. 24-m-12. ?y-30 g. Burning in the stomach for a few minutes after thymol; "drunk" at about 11 a. m.

20 g. Slightly sick at stomach and weak most of the morning; well after dinner.

20 g. No ill effect.

25 g. Sick at stomach upon getting out of bed; better when in bed.

25g. Slightly sick at stomach for about 30 minutes after each thymol.

25 g. Sick at stomach for about 30 minutes after each thymol.

25 g. Burning in stomach for about 10 minutes after each thymol.

18. The following case, representing a total of 4 treatments, complained of a burning in the stomach, a sickness at the stomach, and of feeling drowsy:

(a) Treated four times:

No. 78-m-17. ?y-25 g. Burning in stomach about 1 minute after each dose; also slightly drowsy after thymol.

25 g. Sick at stomach for about 10 minutes after each thymol.

25 g. Same dose; no ill effect.

25 g. Same dose; no ill effect.

19. The following case, representing 1 treatment, complained of burning in the stomach, of sickness at the stomach, and of weakness:

(a) Treated once:

No. 144-m-37. ?y-60 g. Burning for about half hour after thymol; nauseated and weak all day; better in afternoon, but still weak.

20. The following case, representing a total of 2 treatments, complained of a burning in the stomach and of vomiting:

(a) Treated twice:

- No. 105-m-11. ?y-20 g. Burning in stomach for about 10 minutes after each thymol; vomited after second thymol.
25 g. Increased dose; no ill effect.

21. The following 14 cases, representing a total of 16 treatments, complained of a burning in the stomach and of giddiness (or feeling "drunk" or "staggery"):

(a) Treated once:

- No. 91-m-10. ?y-20 g. Burning for about 15 minutes after each thymol; giddiness 2 hours.
No. 171-m-11. ?y-25 g. Burning and dizziness for about 5 minutes after each thymol.
No. 69-m-12. ?y-25 g. Burning for a few minutes; "staggery" for about an hour after thymol.
No. 125-m-13. ?y-25 g. Burning and "drunk feeling" for about 15 minutes after first thymol only.
No. 108-m-14. ?y-30 g. Burning for about 10 minutes and slightly dizzy for about 30 minutes after each thymol.
No. 47-m-15. ?y-30 g. Burning and "kind of drunk" for about 5 minutes after each thymol.
No. 58-m-20. ?y-50 g. Slight burning, and drunk feeling for a few minutes after each thymol.
No. 139-m-30. ?y-60 g. Burning for about 10 minutes and slight dizziness for about 30 minutes after each thymol.
No. 80-m-31. ?y-60 g. Burning for about 10 minutes; "drunk" about 15 minutes.
No. 82-m-36. ?y-50 g. Burning for about 5 minutes after each thymol; "swimming in the head" for 2 to 3 hours.
No. 81-m-37. ?y-60 g. Burning and "drunk" feeling for about an hour after each thymol.
No. 53-m-60. ?y-50 g. Burning for about 15 minutes after each thymol; slightly "giddy" until noon.

(b) Treated twice:

- No. 67-m-11. ?y-20 g. No ill effect.
20 g. Slight burning and dizziness for about 10 minutes after each thymol.
No. 104-m-16. ?y-30 g. Burning for about 10 minutes after each thymol.
40 g. Burning and dizziness for about 15 minutes after each thymol.

22. The following case, representing a total of 6 treatments, complained of burning in the stomach, dizziness, and weakness:

(a) Treated six times:

- No. 63-m-16. ?y-10 g. No effect.
15 g. No effect.
25 g. Slight weakness before dinner.
15 g. Slightly dizzy, otherwise no effect.
30 g. Slight weakness, burning in stomach, and dizzy 30 minutes after each thymol.
30 g. No effect.

23. The following 2 cases, representing a total of 3 treatments, complained of burning in the stomach and of headache:

(a) Treated once:

No. 87-m-33. ?y-50 g. Slight burning for about 10 minutes after each thymol; headache all day.

(b) Treated twice:

No. 186-m-7. ?y-10 g. Burning and headache began an hour after 6 a. m. thymol; had difficulty in swallowing capsules.
10 g. No ill effect.

24. The following case, representing a total of 3 treatments, complained of burning in the stomach and of weakness:

(a) Treated three times:

No. 372-f-10. 1y-10 g. Weak and hungry.
15 g. Burning in stomach for 5 minutes after third thymol.
15 g. No ill effect.

25. The following 3 cases, representing a total of 5 treatments, complained of being sick at stomach and they vomited:

(a) Treated once:

No. 134-m-14. ?y-25 g. Slightly sick for about an hour after last thymol; vomited at 2.30 (after dinner).

No. 206-m-19. ?y-50 g. Sick at stomach and vomited at 10.30 a. m.; then received peppermint water and 40 c. c. additional mag. sulph., no further trouble.

(b) Treated three times:

No. 470-f-12. 3y-10 g. Sick after 10 a. m. salts.
15 g. No ill effect.
15 g. Sick after first thymol, lasting all morning; vomited last thymol.

26. The following case, representing a total of 4 treatments, complained of being sick at stomach, of vomiting, of headache, and of weakness:

(a) Treated four times:

No. 14-m-14. ?y-30 g. Frontal headache about 11 a. m., gradually wore off about noon.
30 g. Slightly sick at stomach for about half an hour after each thymol.
30 g. Slightly sick at stomach after 10 o'clock salts.
16. ?y-45 g. Vomited part of morning salts; slightly sick at stomach for 15 minutes at 12.30; slight headache.

27. The following case, representing a total of 2 treatments, complained of being sick at the stomach, of vomiting, and of being dizzy and weak:

(a) Treated twice:

No. 140-m-13. ?y-25 g. Sick at stomach until 11 a. m.; dizzy for 15 minutes after each thymol.
30 g. Vomited after second thymol; weak during a. m.

28. The following case, representing a total of 2 treatments, complained of being sick at the stomach, of vomiting, and of being weak:

(a) Treated twice:

- No. 371-f-11. Oy-10 g. Vomited second thymol; omitted third; weak and hungry.
 7.5 g. Nauseated at 6 a. m., did not receive thymol until 8; no later ill effect; sickness at 6 a. m. clearly not due to thymol.

29. The following 4 cases, representing a total of 4 treatments, complained of being sick at the stomach and of being dizzy (or "drunk"):

(a) Treated once:

- No. 41-m-23. ?y-60 g. Slightly sick at stomach and "kind of drunk" after thymol, lasted short time only, then all right.
 No. 73-m-26. ?y-42.5 g. Dizzy and sick at stomach for few minutes after each thymol.
 No. 72-m-28. ?y-50 g. Slightly drunk and sick at stomach for few minutes after each thymol.
 No. 34-m-29. ?y-60 g. Drunk feeling short time after thymol. After salts sick at stomach, but did not vomit.

30. The following 2 cases, representing a total of 7 treatments, complained of being sick at the stomach, dizzy, and weak:

(a) Treated three times:

- No. 482-f-14. 9y-22.5 g. Weak after last thymol, otherwise all right.
 20 g. Sick at stomach after second thymol, dizzy, weak, omitted third thymol.
 17.5 g. Sick at stomach until salts, omitted third thymol.
 All right at 1 p. m.

(b) Treated four times:

- No. 472-f-12. 0y-10 g. Weak; otherwise all right.
 15 g. No effect.
 15 g. Sick at stomach and dizzy for 2 hours after second thymol.
 5 g. Sick at stomach after first thymol; second and third omitted.

31. The following case, representing a total of 2 treatments, complained of being sick at the stomach and of feeling drowsy and stupid:

(a) Treated twice:

- No. 85-m-19. ?y-40 g. Slightly sick at stomach for few minutes after thymol; very weak.
 40 g. Was very stupid all morning and wanted to sleep most of time, but said he felt all right.

32. The following case, representing 1 treatment, complained of being sick at the stomach and of headache:

(a) Treated once:

- No. 95-m-13. ?y-20 g. Headache and sick at stomach for about 10 minutes after each thymol.

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33. The following 4 cases, representing a total of 12 treatments, complained of being sick at the stomach and of weakness:

(a) Treated twice:

No. 456-f-16. 2y-25 g. Weak; otherwise no ill effect.

20 g. Answers very untrustworthy. Says she had stomach ache after evening salts and complained of sickness after second thymol. Third thymol omitted. Conduct does not confirm statements. At 1.20 said she was slightly weak, otherwise all right.

(b) Treated three times:

No. 444-m-10. 1y-10 g. Weak; otherwise no ill effect.

10 g. Weak; otherwise no ill effect.

15 g. Says he has felt sick at stomach, but conduct did not confirm statement.

No. 451-f-11. 1y-12.5 g. Weak and slightly sick at stomach.

12.5 g. No ill effect.

15 g. No ill effect.

(c) Treated four times:

No. 469-f-9. 1y-7.5 g. Hungry and weak.

10 g. No ill effect.

10 g. No ill effect.

7.5 g. Sick after first thymol; sickness at stomach after second thymol lasted only short while.

34. The following case, treated twice, complained of being sick at the stomach, of weakness, of dyspnea, and of irregularity of heart. The patient showed an idiosyncracy to thymol. She was treated twice in 1912 and once in 1911:

(a) Treated twice:

No. 386-f-13. 5y-5 g. Nauseated, dyspnea, weak, heart irregular; omitted second and third thymol.

4 g. Slightly nauseated before thymol; was given thymol at 8.

35. The following case, representing a total of 3 treatments, complained of stomach ache, headache, and weakness:

(a) Treated three times:

No. 382-f-10. 5y-12.5 g. Weak and hungry.

15 g. Headache before retiring evening before thymol, but this disappeared with coffee at 9 a. m. Headache after third thymol.

15 g. Slight stomach ache for a few minutes after salts.

36. The following case, representing a total of 2 treatments, complained of vomiting, drowsiness, and headache; he was stupid before treatment:

(a) Treated twice:

No. 115-m-10. ?y-15 g. Headache a. m., seemed very stupid all a. m.; vomited 12 m.

15 g. Stupid before thymol; said nothing hurt him, but lay around and wanted to sleep nearly all morning.

37. The following case, representing a total of 4 treatments, vomited and complained of feeling weak:

(a) Treated four times:

- No. 330-m-11. 6y-10 g. "Felt curious all over," weak. Vomited salts at 10 a.m. Salts repeated and retained. Vomited coffee later. All right at 2 p.m.
10 g. Weak, otherwise no ill effect.
15 g. No ill effect.
15 g. No ill effect.

38. The following case, treated twice, complained of feeling dizzy, drunk, and weak:

(a) Treated twice:

- No. 467-f-13. 8y-15 g. Weak, drunk.
15 g. Slightly dizzy for a few minutes after second thymol.

39. The following 2 cases, representing a total of 3 treatments, complained of headache and dizziness (drunkenness, etc.):

(a) Treated once:

- No. 92-m-9. ?y-20 g. Slight, until noon.

(b) Treated twice:

- No. 86-m-13. ?y-25 g. Drunk for about 15 minutes; slight headache until noon.
25 g. No ill effect.

40. The following case, treated once, complained of headache and weakness:

(a) Treated once:

- No. 437-m-10. 1y-10 g. Slight headache and weakness after thymol; better after coffee.

41. *Special cases.*—The following cases may be classed as special:

- No. 452-f-11. 8y-15 g. Weak and hungry.

17.5 g. Shortly after 10 a.m. salts, patient complained of feeling somewhat sick at stomach. At noon she seemed fairly well, but weak and somewhat sick at stomach; ate crackers and eggs at noon. From noon on she felt alternately better and worse at times, then vomited her dinner. Soda mint was administered and vomited after about 10 minutes. Rested well until 4 p.m., then seemed alternately better and worse until about 6, when she fainted; at about 6.15 she nearly fainted twice, but revived upon smelling aromatic spirits of ammonia. At 7 received enema of normal salt, 1 pint; at 7.20 was feeling fairly well, but drowsy. Rested fairly well until midnight, when she complained of pain in stomach and she vomited. She then slept naturally until 2 a.m., when she complained of pain in stomach. Then rested fairly well until 6.30 a.m., when she dressed. Vomited, said she felt weak, but was able to walk. For two days she remained rather weak. When seen 7 days later was well.

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Patient was a frail, nervous, somewhat hysterical girl, who, according to statements by herself, her mother, father, and brother, is subject to attacks similar to this, especially when hungry. Her mother stated that Epsom salts nearly always made the child ill. The nausea might have been due either to the salts or to the thymol, with the possibilities seemingly in favor of the salts, since she seems to have an idiosyncracy to salts, and since she consistently denied any feeling of drunkenness or dizziness, or even headache (except momentarily after wrenching to vomit). The weakened condition was doubtless due, in part at least, to lack of food, including refusal to take coffee during morning of treatment.

No. 484-m-8. 8y-12.5 g. Discharged apparently well at 1 p. m.; later taken sick, see below.

10 g.. No ill effect.

10 g. No ill effect.

In the first treatment, this boy behaved very badly during the night, talking and playing constantly, and obtaining scarcely any sleep. During the morning of treatment he showed no unfavorable symptom of any kind, and was discharged at 1 p. m., apparently perfectly well.

About 6 p. m. news reached us that the boy was sick. His pulse was 80, regular and full; he seemed very drowsy.

It seems that upon being discharged from treatment, he went to a store and—as was described to us—literally “filled up” with peanut brittle; then he ate soda crackers, canned oysters, and sweet-potato pie. Shortly after eating he had complained of feeling sick, and had cried; he had three more movements of the bowels which he complained burned him; he became drowsy.

Patient stated at 6 that he felt better, but was weak and drowsy. He had been very thirsty, and had taken water twice.

At 6.55 p. m. his pulse was 72, temperature, $97\frac{3}{4}$; says he feels all right, except sleepy.

At 8 p. m., pulse 59; says he feels all right, except weak and hungry. Has had two more small movements. Was now given an alcohol rub and warm blanket, with hot jar at feet.

At 8.40 p. m., pulse 68; boy's mother states that he is very sensitive to Epsom's salts.

At 10 p. m., pulse 72, good, regular.

At 7 a. m., patient felt better after night's sleep.

No. 480-f-10. 7y- 7.5 g. Weak.

10 g. No ill effect.

10 g. Slightly sick at stomach a few minutes after first thymol (5 grains). Discharged apparently well at 1 p. m.

The following day father of the patient called and stated that child complained of pain in the bowels (pointing to regions of transverse colon and stomach); that she is subject to stomach ache, but that this attack seems different; the pain began about 5 to 6 hours after patient was discharged, and continued the next day; she does not feel either dizzy or drunk.

The third day patient was better.